Photo: Upper Thames River Conservation Authority

Remedial Action Plans and Watershed Implementation

Section 9

Section 9: Remedial Action Plans and Watershed Implementation

9.1 Introduction

In addition to the development of LaMPs, Annex 2 of the Great Lakes Water Quality Agreement called for the development of Remedial Action Plans (RAPs) for the most environmentally degraded Areas of Concern around the Great Lakes. There are 12 Areas of Concern (AOCs) in the Lake Erie basin: two binational, one Canadian and nine U.S. The RAPs have a smaller geographic focus than the LaMP, often encompassing only part of a watershed, and focus on restoring locally impaired beneficial uses. Implementation of remedial actions has been underway in most RAPs for over 12 years, using a combination of federal, state, provincial and local resources. The restoration of the AOCs will help to improve Lake Erie, and actions to restore Lake Erie will often benefit the AOCs. It is essential for the Lake Erie LaMP to continue to cultivate communication with the RAPs and to benefit from the successful partnerships and programs that the RAPs have already created. In many ways the success of the LaMP depends on the success of the RAPs.

Source track-down for many of the stressors affecting Lake Erie identified the AOCs, as well as certain other watersheds draining into the lake, as key areas for remediation. Land use management practices in particular have a significant impact on tributary loading to the lake. Therefore, the LaMP will focus on implementing management actions at the watershed level as a primary step towards restoring beneficial uses to the lake.

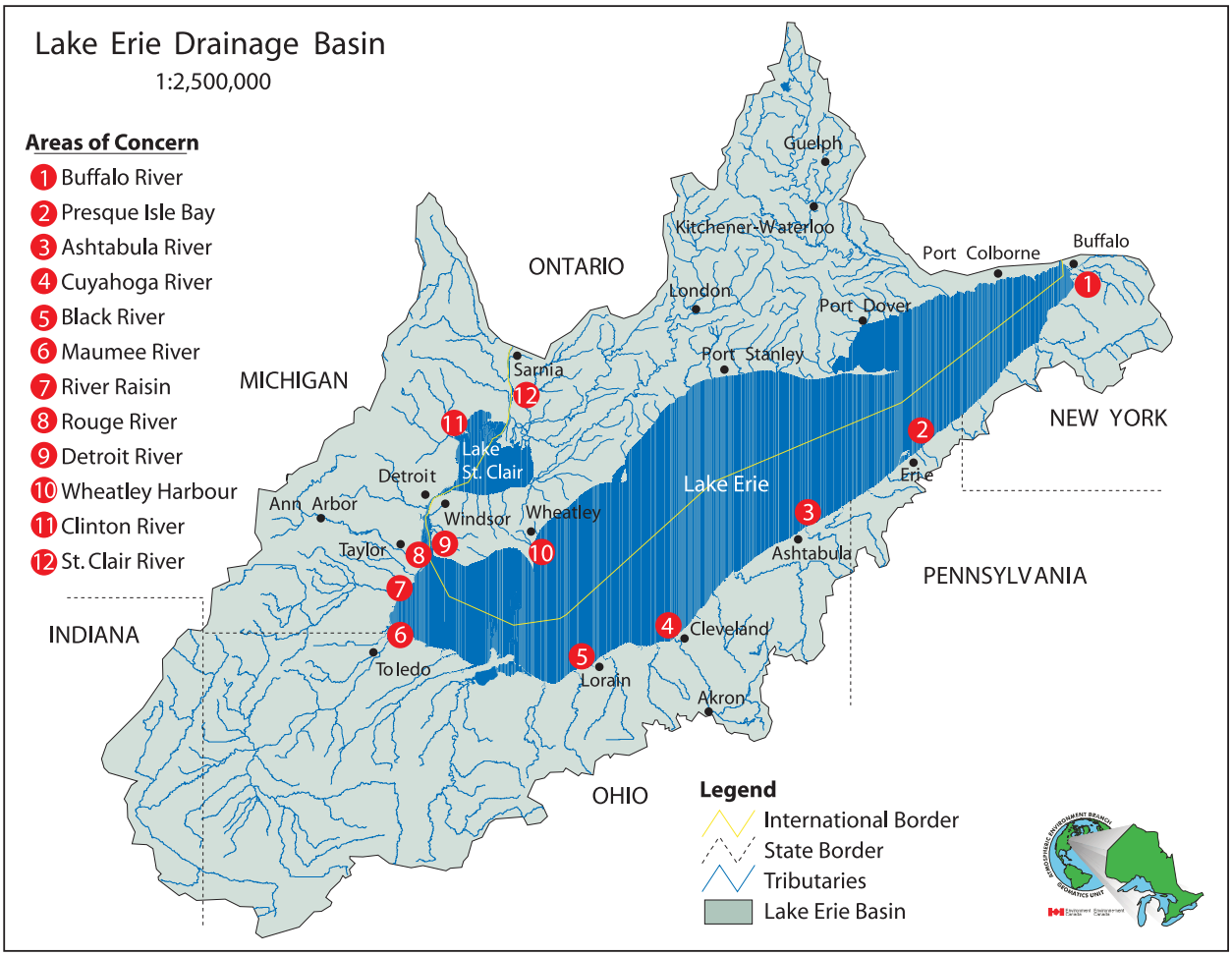

Figure 9.1: Areas of Concern in the Lake Erie drainage basin

The watershed is widely regarded as an appropriate unit to manage natural resources. As part of the Lake Erie LaMP process, the Fuzzy Logic model developed by and for the Lake Erie LaMP identified land uses as the single biggest driver of in-lake conditions. Watershed management focuses on these uses and the sources of contaminants that are associated with land based activities. On a broader scale, Canadian Justice Dennis O'Connor's reports stemming from the Walkerton, Ontario tainted water tragedy reaffirmed the importance of watershed management. He focused many of his recommendations on mechanisms to strengthen and institutionalize watershed management through Source Protection Plans in Ontario as a means to protect human health and the environment.

There are many watershed based projects underway around the Lake Erie basin; however, as with the RAPs, most of them are designed to address problems in that watershed and do not address potential impacts to Lake Erie. As the Lake Erie LaMP progresses, the LaMP partners will continue to assess these existing watershed projects and encourage better connections between the watersheds and the overall state of the lake. Watershed action plans and Total Maximum Daily Loads (TMDLs) underway in the U.S. will be important to tap. In Ontario, the nine Conservation Authorities in the Lake Erie basin are formed on a watershed basis. The Province of Ontario's initiatives in support of watershed-based source water protection will provide enhanced tools to address the stresses imposed on Lake Erie by adverse conditions in key tributaries.

The following sections highlight the major activities completed or underway in the Lake Erie RAPs and several selected watershed initiatives. Note that these activities are only a small representation of the ongoing watershed work throughout the basin. For the most part, these updates cover only those actions implemented or initiated since the Lake Erie LaMP 2002 Report was published. In the future, this section will highlight accomplishments in other watersheds as they become more focused on implementation of management efforts to assist in achieving the goals of the Lake Erie LaMP.

9.2 Remedial Action Plan Updates

Buffalo River RAP, New York (www.epa.gov/glnpo/aoc/buffalo.html)

The Buffalo River empties into the far eastern end of Lake Erie and most of its flow moves directly into the Niagara River. Technically, it is considered a source to Lake Ontario rather than to Lake Erie. The AOC extends from the mouth of the river upstream approximately 10 km.

The Buffalo River RAP process was originally developed as a partnership between the New York State Department of Environmental Conservation (NYSDEC) staff and the Buffalo River Citizens' Committee. This committee was established by NYSDEC in 1987 and is still made up of representatives from community, environmental, academic, sporting, and local government interests. The combined Stage 1 and Stage 2 Remedial Action Plan was completed in November 1989 as a working document. RAP Status Reports have been published since 1991 to update commitments, track implementation, and celebrate accomplishments. Remedial activity efforts have been focused in six major areas: water quality monitoring; river bottom sediments; inactive hazardous waste sites; municipal and industrial wastewater treatment facilities; combined sewer overflows; and fish and wildlife habitat. RAP strategies and progress are updated in the most current Buffalo River RAP Status Report dated July 2002. Implementation projects include:

- Starting October 2003, the Friends of the Buffalo Niagara Rivers (FBNR) received U.S. EPA funding to provide RAP management. The focus is on research, priority project implementation, and delisting considerations.
- The FBNR will develop programs and seek funding for RAP gaps and needs to address non-point sources, habitat restoration and watershed open space improvements.
- The FBNR will form working groups to review the status of the Beneficial Use Impairments. The first steps will include establishing delisting criteria for the impairments. The groups are also to identify information gaps and remedial actions necessary for restoration and protection.

- The FBNR are to estimate implementation costs for project considerations. A Report Card is to be established that will clearly define the RAP process and report to the public on the progress, status of use impairments, and ongoing/proposed remedial measures.
- The FBNR will address project tracking and RAP coordination including: the City of Buffalo's waterfront revitalization; the Buffalo Sewer Authority's CSO correction; and the U.S. Army Corps of Engineers (USACE) funded study of aquatic conditions.
- Three habitat improvement projects have been constructed to address habitat impairments with funding provided through U.S. EPA. These habitat project plans were developed by Erie County with the City of Buffalo, U.S. Fish and Wildlife Service, USACE, and NYDEC.
- The Buffalo Sewer Authority has received Bond Act funding to address sewer overflows.
- The SUNY Buffalo State College Research Foundation, in conjunction with the FBNR, is conducting a study funded by the USACE to assess river sediments and remedial needs. This study will evaluate the Hamburg Drain CSO, update land use, inventory land cover, assess surface sediments for bioaccumulation, define bed sediment characteristics and watershed sediment transport, and assess the impact of abandoned shoreline structures.

Presque Isle Bay RAP, Pennsylvania (www.epa.gov/glnpo/aoc/presque.html)

Located in the northwestern corner of Pennsylvania on the southern shore of Lake Erie, Presque Isle Bay is a 3718 acre (1505 hectare) natural embayment formed by a 4.5 mile long (7.24 km) recurved sand spit. Over 80% of the bay's watershed is comprised of urban and industrial land uses in the City of Erie and its outlying townships. As a relatively closed system with a hydraulic detention time of almost 2.5 years, Presque Isle Bay tends to act as a natural "settling basin" for sediment entering its waters. Given the urban nature of the majority of the watershed, much of this sediment is contaminated with heavy metals and various organic compounds. Program highlights include:

- Presque Isle Bay was designated as the 43rd Great Lakes Area of Concern by the U.S. Department of State in 1991. An Ecosystem Study and Background Report was issued.
- Pennsylvania Department of Environmental Protection (PADEP) examined over 3100 brown bullhead catfish from the bay. Histopathologically confirmed external tumor rate of 64% and liver tumor rate of 22% were documented in 1992.
- Stage 1 RAP was submitted to the International Joint Commission (IJC) in 1993.
- RAP Update was submitted to IJC in 1995 describing new work completed and amending the 1991 RAP.
- Battelle Sediment Study was completed in 1997 suggesting that the implementation of source control measures in the watershed may be sufficient to allow for natural recovery of bay sediments.
- An ongoing brown bullhead study reveals distinct trend of decreasing tumor rates. Histopathologically verified rates 17.4% for external tumors and 0% for liver tumors as of 1999.
- Based on preliminary findings of elevated sediment dioxin and furan levels, PADEP collected fish tissue from six resident bay species in 1991. Dioxin/furan tissue burden was well below advisory levels in all species examined.
- Gannon University provided results of a sediment investigation conducted jointly with U.S. EPA in 2000. The study utilized a "triad" sampling approach entailing sediment chemical sampling for metals and PAHs, benthic macroinvertebrate assemblage analysis, and sediment toxicity testing. Sediment dioxin/furan levels were also investigated at request of PAC. Metals and PAH results generally support earlier Battelle findings of widespread, low-level contamination without identifiable hot spots. Due to lack of screening criteria in Pennsylvania, dioxin/furan results were compared to New York state sediment screening criteria. Concentrations of these compounds were below human health screening levels but exceed wildlife screening criteria, prompting the Department fish tissue study described above.

- In 2002, the PAC voted to re-designate Presque Isle Bay as an Area of Concern in Recovery Stage and submitted a request to U.S. EPA.
- In 2002, U.S. EPA approved re-designation request and Presque Isle Bay became the first AOC in Recovery Stage in the U.S.

The designation of Presque Isle Bay as an Area of Concern in Recovery Stage means that monitoring rather than further remedial action is necessary to verify the restoration of BUIs in the bay. The PAC has also formed a watershed monitoring task force to focus monitoring and pollution prevention efforts at the source. In furtherance of these goals:

- PAC has developed a 10-year monitoring strategy to track the recovery of the AOC. Draft monitoring plans are being developed for the bay's *restriction on dredging* and *fish tumors or other deformities* beneficial use impairments.
- PAC has also formed a watershed monitoring task force to focus monitoring and pollution prevention efforts at the source.
- Brown bullhead monitoring began in 2002. In accordance with the monitoring framework outlined in the 2002 RAP Update, bullheads will be examined annually for the presence of grossly observable external tumors. Histopathological analysis of orocutaneous and liver tumors will also be conducted in 2002, 2003, 2004, 2007, and 2010. Results will be compared to tumor rates at various reference sites and appropriate list/delist criteria. Preliminary results to date indicate that orocutaneous tumor rates are roughly comparable to levels in 1999, although these data have not been subjected to statistical analysis. One individual (2.1%) in 2002 had a histologically verified liver tumor.
- A series of workshops have been held to address the fish tumor BUI in Great Lakes AOCs. Several important outcomes are expected, including recommendations for standardized sampling and histological protocols and updated AOC list/delist criteria for the *fish tumor* BUI.
- In addition to co-sponsoring the fish tumor BUI workshops, Pennsylvania Sea Grant has hosted several regional workshops on Type E ("Avian") botulism, the Great Lakes Fisheries Leadership Institute, Aquatic Nuisance Species Hazard Analysis Critical Control Point (ANS HACCP) workshops, and a new Non-Point Education Program for Municipal Officials (NEMO).
- Over 600 volunteers participated in Pennsylvania's portion of the International Coastal Cleanup in September 2003. 42,363 pounds of discarded trash were collected along 37 miles of Lake Erie coastline and tributary streams.
- The County of Erie sponsored a household hazardous waste collection day in September 2002, netting over 100 tons of hazardous waste.
- Since 1999, the Pennsylvania Department of Environmental Protection has awarded over $1.6 million in Growing Greener grants to fund various environmental projects in the Pennsylvania portions of the Lake Erie watershed. Highlights of these projects include the establishment of a PA Lake Erie Watershed Association and several smaller sub-basin associations, several wetland restoration projects, comprehensive biological stream assessments of Lake Erie tributary streams, stream bank stabilization/erosion control projects, and numerous environmental education initiatives.

Ashtabula River RAP, Ohio (www.epa.gov/glnpo/aoc/ashtabula.html)

The Ashtabula River RAP process began in 1988 with the establishment of the Ashtabula River RAP Advisory Council. Years of unregulated discharge and mismanagement of hazardous wastes along the river and Fields Brook (a superfund site) seriously contaminated sediments and degraded biological communities. The lower two miles of the river encompasses the area of concern. The 1991 Stage 1 Report documented at least six of 14 beneficial uses impaired, all related to contaminated sediments. Both the commercial and recreational uses of the river were in danger of being shut down because there was no disposal site for contaminated sediments if they were dredged. An interim dredging project in 1993 removed several feet of relatively uncontaminated surface sediments to keep the recreational harbor open.

The Ashtabula River Partnership (ARP) was created in 1994 as a comprehensive, structured, concentrated effort to get the river dredged, and as an alternative to the impending designation of the river as an extension of the Fields Brook Superfund site. An oversight coordinating committee was established as well as several technical committees, and a local coordinator was hired. The non-profit Ashtabula River Foundation was incorporated in 1997 to manage financing for the river cleanup. Since 1990, extensive sediment characterization studies have been done, including: mapping of pollutant concentrations (particularly PCBs); estimation of sediment volume to be removed; delineation of PAH distribution; TCLP testing to ensure sediments did not qualify as hazardous waste; screening for low level radioactive waste; and modeling sediment transport, scouring and deposition rates. A creative mix of funding from local partners, U.S. EPA, U.S. Army Corps of Engineers, U.S. EPA-GLNPO and Ohio EPA provided seed funding for initial ARP formation, preliminary comprehensive management plan and environmental impact statement preparation (CMP/EIS), preliminary engineering design and location of the disposal facility, and the aforementioned studies. Extensive reviews of all agencies' authorities were conducted to determine the critical decision points and whose responsibility they would be. Extensive internal communication and cross program coordination has been employed. Updated program highlights include:

- Final Comprehensive Management Plan/Environmental Impact Statement completed in 2002.
- Conducted sediment dewatering bench scale/pilot studies to determine if and how the river sediment dewatering facility discharge may be able to meet Ohio water quality standards.
- Collected samples of sediments associated with river bulkhead structures to answer serious concerns that remedial dredging may cause bulkhead failure and the need for repair/replacement.
- Consolidated landfill design criteria for preliminary design to satisfy State permitting requirements for disposal facility
- Conducted hydro-geological and geo-technical studies of two separate properties for the sediment dewatering facility operation and the dredging disposal facility.
- Organized Design Coordination Team (DCT). Completed preliminary engineering design. Began detailed design work for dredging, dewatering and disposal facilities. Major role of DCT is to oversee issues related to design, including scheduling of report and work products; develop plans and specifications for all facilities and operations, anticipated real property and relocation requirements for project construction; contract awards; contract costs; anticipated requirements for performance of operation, maintenance, repair, replacement and rehabilitation of the river project, and other related matters.
- Purchased 50-acre property for proposed river sediment landfill at former RMI property adjacent to Fields Brook Superfund site landfill.
- In 2003, after nearly two decades, U.S. EPA completed remediation of the 3-mile Fields Brook Superfund site - a necessary prerequisite to the Ashtabula River remedy.
- Developing a Project Cooperation Agreement (PCA) that will identify partners for project implementation and costs. Also working on a decision document to contain covenants not to sue.
- Federal and state trustees commenced work for a formal Part B assessment on behalf of an Ashtabula River natural resource damage assessment (NRDA) claim under CERCLA authority sampling water column, fish, sediments - all of which is being coordinated with the Ashtabula River remediation project.
- 2003 local river partnership office funding support confirmed from Ashtabula City Council, Ashtabula Township, and Ashtabula County. This is the first time that such support has been provided exclusively by the local community.
- Numerous broadcasts on community cable, local radio, and monthly meetings with city, county, and township officials to provide an update on Ashtabula River remedial project, generate cooperation and understanding on requirements for local (nonfederal) sponsorship, describe requirements for the project Design Agreement and explain how local office funding support had been applied toward the project.

- Numerous presentations with local schools, Ashtabula County Builders Association, Clean Water Campaign Council, Northeast Ohio Watershed Council, League of Women Voters, USACE Buffalo District incoming commander(s), state and congressional reps.
- Advertising over 140 spots about Ashtabula River remedy for one month on CNN, Discovery, and Lifetime channels.
- $54,966 in grants from the Ohio Environmental Education Fund continued the Ashtabula After School Discovery program called "Waterways Adventure" and expanded the science curriculum and hands-on experience of three school districts for 2000 school kids in grades 4,5,6,8, and 12 to conduct field monitoring at selected lake, river, and pond sites.
- Convened meetings with river marina owners/operators to: 1) discuss the potential of another interim dredging to improve navigation prior to environmental dredging, 2) solicit local marinas' willingness to pay for same, 3) review potential interim disposal sites for dredged sediments, and 4) query them about historic information relative to the integrity of river bulkhead structures installed before 1945/onset of Fields Brook firms operations.
- Participated with local community groups, including litter prevention and recycling office, on three separate cleanup events in area neighborhoods.
- Sponsored Earth Day essay contests among Ashtabula County elementary and high schools.

Cuyahoga River RAP, Ohio (www.cuyahogariverrap.org)

The 1992 Stage 1 Report identified 10 of 14 beneficial use impairments in the Cuyahoga AOC. The AOC covers the watershed of the lower 45 miles of the river and the shoreline east and west of the mouth of the Cuyahoga River. The Stage 1 Report was updated in 1995 followed by the *Early Implementation Report* in 1996 that documented activities underway that addressed the identified use impairments.

The Cuyahoga River RAP Coordinating Committee works in coordination with the Cuyahoga River Community Planning Organization (CRCPO), a non-profit organization, to identify and implement educational programs and remedial actions with a variety of local stakeholders. The priorities in the Cuyahoga River AOC over the past two years have been to participate in the development of the Ohio EPA Total Maximum Daily Load (TMDL) Report, support and implement habitat restoration projects, complete a wetland inventory of the entire area of concern, work with the U.S. Army Corps of Engineers on navigation channel studies, develop state-of-the-art GIS based tributary watershed maps, foster the development of tributary watershed groups, and serve as the point of contact (River Navigator) for the American Heritage River program for the Cuyahoga River. Recent accomplishments include:

- Completion and dissemination of "A RAP Guide to Understanding TMDL" for local citizens and elected officials.
- Development and support of tributary watershed groups in Yellow Creek, West Creek (West Creek Preservation Committee), Tinkers Creek (Pond Brook Initiative), Mud Brook (Mud Brook Consortium) and Chippewa Creek; with a goal of establishing tributary watershed councils or groups with effective local environmental protection ordinances, storm water management strategies, educational programs and greenspace/riparian preservation mechanisms.
- The RAP and its partners implemented several habitat projects including: stream restoration using soil bioengineering techniques in Mill Creek in Highland Hills; completion of wetland restoration along West Creek; Pond Brook Streamside Vegetation Project; the Stearns Farm stream and wetland restoration project; and additional stream restoration work in the Chevy Branch of Big Creek.
- In 2003 the RAP and American Heritage River program partnered with NASA, Ohio View, and Kent State University to sponsor the Scientific Outreach and Application using Remote Sensing (SOARS) program that utilized NASA satellite imagery, digital elevation models, and GIS to focus on the entire Cuyahoga River watershed.

This project studied urban sprawl over a 25-year period and its relationship to loss of forest and farmland, effects on river and lake temperatures, impact on water clarity and the acceleration of impervious surfaces and resultant runoff. The results of the SOARS program will enhance community awareness of potential environmental threats and assist in the local decision-making process for watershed stewardship. The RAP is developing a series of workshops, using SOARS data maps, aimed at assisting community officials in determining appropriate local BMPs to reduce runoff and non-point pollution.

- Conservation easements are being obtained and held by both Cuyahoga and Summit County Soil and Water Conservation Districts, various park systems and conservancy organizations. These have resulted in over 1600 acres of land in the AOC held in easements in addition to over 33,000 acres protected within the Cuyahoga Valley National Park, county metroparks and other public lands.
- In 2003 the USACE initiated collection of data from RAP stakeholders to develop a comprehensive sediment transport model for the Cuyahoga River watershed, leading to better decisions on sediment and storm water issues and best management practices.
- In 2003 the RAP and USACE initiated a Navigation Channel Habitat Feasibility study to identify habitat restoration techniques and opportunities for the navigation channel.
- The Cuyahoga County Planning Commission has completed the Cuyahoga County Greenspace Plan and is in the process of promoting greenspace preservation and restoration efforts to local governments and area stakeholders. The Planning Commission is also developing the Cuyahoga Valley Initiative with local stakeholders to identify zoning and ordinance modifications for future development and preservation efforts.
- RAP consultants completed a wetland survey in 2003 that identifies wetlands and potential restoration and preservation opportunities in the Cuyahoga County portion of the watershed. This survey complements similar studies completed for the Cuyahoga Valley National Park and Metroparks Serving Summit County resulting in comprehensive wetland identification maps for the AOC.
- The RAP is currently coordinating a project to develop a decision support system to integrate environmental issues and concerns with transportation planning, utilizing grants from U.S. EPA and the Lake Erie Protection Fund.
- The RAP assisted in coordinating development of the 2003 TMDL report by Ohio EPA for the lower Cuyahoga River and will continue its TMDL support by assisting with the Tinkers Creek Stressor Identification Study required by the report.
- Conducted an assessment of contaminated sediments on the Old Channel of the Cuyahoga River in 2002 and 2003. PAHs were found to be the primary critical pollutant and next steps will be to consider options for remediation.

Black River RAP, Ohio (www.epa.state.oh.us/dsw/rap/blk_home.html)

The Black River RAP process began in 1991 with the establishment of the Black River RAP Coordinating Committee. Several major remedial actions had occurred on the river prior to the initiation of the RAP process, particularly in regard to point source dischargers. The entire watershed was designated as the area of concern largely due to non-point sources. The 1994 Stage 1 Report documented 10 of 14 beneficial uses as impaired, with non-point source runoff identified as the main cause of impairments in all but the lower section of the mainstem, where point sources also still significantly impact the river. The 1999 Ohio EPA basin survey report revealed environmental improvement compared to the 1994 report, but the improvements were not as dramatic as those seen between the 1994 and 1987 reports. This is most likely a reflection of when point source controls were implemented. USX/Kobe dredging of PAH-contaminated sediments, implemented under an enforcement action, resulted in dramatic lowering of the incidence of tumors in brown bullhead by 1998. The RAP adopted a Riparian Corridor Resolution in 1996 that outlined the need for riparian corridor establishment & protection. A Strategic Long Range Plan completed in 1997 outlined RAP

direction for the next several years. A symposium titled "Protecting What's Been Gained in the Black River" held with IJC Water Quality Board in 1998 celebrated accomplishments and hardened the resolve to do more.

The Black River has been scheduled for a TMDL study, but the start of this important watershed assessment is being delayed, in part, until a final report is released on a RAP-backed dissolved oxygen study. The report on the dissolved oxygen study, which was initiated in 2001, is expected in February 2004. Drought-like conditions during the originally designed sampling year of 2001 necessitated an extension of the study into 2002. The Black River RAP has been reviewing studies and implementing environmental surveys in an effort to assess the AOC on a subwatershed by subwatershed basis in an effort to re-designate the beneficial use impairments of specific stream segments or subwatersheds. Accomplishments include:

- The Black River received national attention with the construction of a fish habitat shelf at the Black River Landing brownfield development site. The fish habitat shelf is a shallow underwater ledge specifically constructed as a spawning area, nursery and general aquatic habitat site in the main stem of the Black River. Since its construction, the fish habitat shelf has attracted large numbers of fish and shown dramatic improvement in the fish community structure.
- The Lorain County General Health District has developed a Pilot Program for the Operations and Maintenance of Home Sewage Treatment Systems (HSTS). Older and failed or failing HSTS have plagued the water quality of the Black River basin. Once developed, this pilot program will be exported to the remainder of Lorain County and could be used for other counties in the Lake Erie basin.
- The Black River RAP capped the completion of a 319 Grant with a Ten Event outreach effort. The events included development of a "Virtual Tour of the Black River Watershed" website, a continuing education class for local realtors on HSTS and a mini-seminar for builders and developers on construction site best management practices.
- With RAP assistance, extensive restoration projects were completed on the East and West Forks of the East Branch of the Black River. These two highly channelized streams suffered from loss of riparian protection, stream bank erosion, and wetland destruction.
- Recent improvements to sediment quality in the main stem of the Black River led the Ohio Department of Health to conduct a risk assessment related to the Contact Advisory in place since 1983. The contact advisory was lifted in 2004.
- As urban and suburban sprawl continues to impact the Black River, Lorain County has started work on developing an Environmental Strategic Plan that will guide future development of the county in an environmentally protective manner.
- In April 2004, U.S. EPA approved the RAP's application to upgrade the fish tumor use designation from impaired to "in recovery".
- Ohio Governor Bob Taft recognized improvements to the Black River AOC at an earth day event in April 2004.

Maumee River RAP, Ohio (www.maumeerap.org)

The RAP process began in 1987 and was organized under the Toledo Metropolitan Area Council of Governments with oversight by Ohio EPA. The boundaries of the Maumee AOC were initially defined as the area from the Bowling Green water intake (River Mile 22.8) downstream to the Maumee Bay and Lake Erie, including Duck Creek, Otter Creek, Cedar Creek, Grassy Creek, Crane Creek, Swan Creek and the Ottawa River. In 1992, the AOC was expanded to include Packer Creek, Turtle Creek, Rusha Creek and the Toussaint River. Over 100 stakeholders participated in preparation of the Stage 1 Report, which was completed in 1990. Ten of 14 beneficial uses were documented as impaired. A *Recommendations for Implementation Report* was completed in 1991 and identified five high priority areas: agricultural runoff; landfills and dumps; wetlands and open space; urban stormwater runoff; and community involvement.

Action groups were formed to focus on each of these issues as well as overall support. Two action groups were formed to specifically focus on the myriad problems of the Ottawa River and Swan Creek. A $3.5 million study (special line item federal budget appropriation) was completed to assess current conditions in the AOC and link waste sites to contamination in streams. Many programs have been initiated or supported to reduce agricultural runoff. Remedial actions at the Dura, Stickney, Tyler and King Road landfills have reduced significant loads of PCBs to the Ottawa River. Soil and sediment remediation at the Textileather and Fraleigh Creek (formerly unnamed tributary) sites removed more than 57,000 lbs of PCBs from the Ottawa River. Many educational workshops have been conducted covering such topics as: agricultural runoff; urban runoff; pollution prevention; drinking water and pesticides; watershed planning; environmental risk, etc. A RAP Strategic Plan was completed in 1997.

The Maumee RAP continues a very active public outreach and education program. The priorities the last two years have focused on keeping the public informed and getting them more involved, as well as continuing to address non-point sources of pollution. Some of the major accomplishments over the last two years are listed below.

- Completed a 10-Year Activities and Accomplishments Report.
- Hosted a review/site visit by the IJC Science Advisory Board that garnered high praise.
- Received a 319 Grant to fund a watershed coordinator to work in sync with the RAP coordinator to develop and implement a Stage 2/Watershed Action Plan.
- Initiated a large public education campaign called "Give Water a Hand" designed to meet some of the education requirements of the Phase 2 Storm Water Regulations and to alert folks to the importance of conservation, septic system maintenance and storm water management.
- Completed a documentary entitled: *Fate of a River, Revisited*, contrasting the deplorable state of the river in the 1960s to today's situation. Shown on PBS and presented at numerous meetings locally.
- Developed a Partnering for Clean Streams Patch Program for Scouts.
- Developed Storm Water Management Standards Manual.
- Continued to implement Toussaint River Improvement Incentive Project enrolling 44 miles of stream bank and 300 acres in filter strips/set asides. Also included a component on home septic system education.
- Grant from GLNPO to prioritize Ottawa River sediment remediation projects.
- Conducted annual Clean Your Stream Events.
- Updated a GIS based wetlands map for the AOC.

River Raisin RAP, Michigan

(www.riverraisin.org/index.html or www.epa.gov/glnpo/aoc/rvraisin.html)

The River Raison AOC is located in Monroe County, Michigan. The AOC includes the lower 2.6 miles of the River Raison from the low head dam (Dam #6) and extends 0.5 miles out into Lake Erie, following the federal navigation channel. It also includes the nearshore zone of Lake Erie one mile north and south from the river mouth. The River Raisin Public Advisory Council is a subcommittee of the River Raisin Watershed Council. The Watershed Council, a recognized 501c(3) entity, is composed of municipal representatives and individual local stakeholders, and services 1069 sq. miles.

Recent and ongoing projects include:

- In 2003, The River Raisin Watershed Council was awarded $12,800 in State grant funds to assess the benthic macroinvertebrate community and stream habitat in the River Raisin Watershed.
- The River Raisin PAC drafted an update of the Remedial Action Plan in 2002.
- The remediation of PCBs from the Consolidated Paper Co. is proceeding with funding from the Clean Michigan Initiative – Brownfield Redevelopment Fund.
- The U.S. EPA-GLNPO, with assistance from the Michigan Department of Environmental Quality (MDEQ), continued assessing and delineating the remaining sediment contamination in the lower portion of the AOC. Reports are available that

indicate toxicity and bioaccumulation of PCBs continue to be highest in the formerly remediated area below the turning basin, with additional hotspots downstream. Meetings and presentations have been held with the PAC to keep them informed. The MDEQ is planning to nominate the River Raisin AOC for project consideration under the Great Lakes Legacy Act.

Rouge River RAP, Michigan (www.rougeriver.com/)

The oldest and most heavily populated and industrialized area in southeast Michigan is located within the Rouge River watershed that covers 12,010 km^2. The river has four main branches totalling 125 miles of waterways, 400 lakes and ponds and provides recreational opportunities to more than 1.5 million people. In 2003, several newspaper articles highlighted the Rouge River's recovery, citing tangible markers of progress in a decades-long battle to restore the Rouge. Quality indicators including dissolved oxygen, numbers of aquatic insects and water clarity have steadily improved in recent years. Recent Rouge River AOC highlights include:

- A Final Draft Update of the Remedial Action Plan was developed in 2003, which includes an updated assessment of beneficial use impairments and delisting criteria for the AOC. Publication is scheduled for December 2003.
- The local municipal governments of the watershed joined together to form the Rouge River Assembly, comprised of representatives appointed by the appropriate governing body in each township, city, and county. The purpose of the assembly is to provide mutual assistance in meeting the storm water permit requirements under the MDEQ watershed-based, general storm water discharge permit, and other environmental issues that may arise.
- Watershed management plans and storm water pollution prevention initiatives have been completed and submitted to MDEQ for comment. Both identified excessive flow variation, high bacteria counts, low dissolved oxygen and high nutrient concentrations as the major factors degrading the Rouge River.
- The Rouge Gateway Project continues to focus on the environmental restoration of the lower several miles of the river. Phase I of the Rouge Oxbow Restoration is complete. Phase II includes CSO modification and Phase III will provide open connection to the Rouge River. Estimated completion is 2006. This project is funded by grants from the State of Michigan Clean Michigan Initiative (CMI) and the Rouge River National Wet Weather Demonstration Project. These projects have been effective in eliminating or controlling the discharge of untreated sewage from approximately half of the watershed's CSOs.
- The Friends of the Rouge (FOTR) involved volunteers in programs such as Storm Drain Stencilling, Frog and Toad Survey, the Rouge Education Program, Rouge Rescue/River Day, and other community pollution prevention initiatives. The Rouge River Advisory Council was incorporated as a committee of the FOTR.
- Results from the resident and caged fish sampling in Newburg Lake indicate that the contaminated sediment cleanup conducted in 2001 was successful in significantly lowering PCB concentrations in the fish. The total consumption ban was replaced with a less-restrictive consumption advisory.

Detroit River RAP

The Detroit River is a 51 km connecting channel between Lake St. Clair and Lake Erie. The binational AOC includes the Detroit River and its watersheds, covering an area of over 2000 km^2. Over 75% of the total land area is in Michigan. Some 100 communities rely on the river for drinking water with most of the population concentrated in the cities of Detroit, MI and Windsor, ON.

The RAP identified 11 beneficial use impairments of a possible 14. Causes of impairments are historical and current industrial activity, agricultural practices, and urban development in the watershed. Major sources of impairment to the AOC are from CSOs, sanitary sewer overflows, municipal and industrial discharges, and storm water runoff. Due

to high volumes of water entering the river, upstream sources contribute considerable contaminant loads. The river is the single largest source of contaminants to Lake Erie.

Distinct RAP implementation frameworks have been developed for the Canadian and American sides of the AOC, under the guidance of the 1998 Four Agency Letter of Commitment signed by: Environment Canada, U.S. EPA, Ontario Ministry of the Environment, and Michigan Department of Environmental Quality. The Detroit River RAP Team guides the U.S. implementation. The Detroit River Canadian Cleanup (DRCC) process guides Canadian implementation efforts. The DRCC is organized into: the Detroit River Canadian Steering Committee comprised of senior managers; the Detroit River Canadian Implementation Committee comprised of technical Agency representatives; Detroit River Canadian Public Advisory Committee; and the Detroit River Outreach and Communication Committee.

Jointly, the Detroit River RAP Team and the DRCC are working toward fostering actions that will improve the conditions of impaired beneficial uses.

U.S. (www.epa.gov/glnpo/aoc/detroit.html)

Achievements to date for the U.S. AOC include:

- U.S. EPA has been facilitating a workgroup comprised of USACE, American Heritage Rivers, MDEQ, and City of Trenton, to undertake the dredging of Black Lagoon in the Detroit River. This project was identified in the 1996 Detroit River Remedial Action Plan as one of the priority contaminated sediment cleanup sites in the River. If funded under the Great Lakes Legacy Act, dredging of 27,000 cubic yards of contaminated sediment is expected to begin in 2004.
- In 2004, the Detroit Recreation Department will begin a $250,000 ecological restoration at the 41-acre Blue Heron Lagoon located on Belle Isle.
- The City of Detroit also plans to spend $545,000 to provide improvements to the Detroit Riverside Park promenade and to develop an on-site fisheries education program.
- Detroit Recreation Department received $500,000 in 2003 to construct a habitat for a lake sturgeon-spawning reef in the Detroit River off of Belle Isle.
- In 2003, Detroit Water and Sewage Department completed a $187 million CSO disinfection basin project at the head of Conners Creek capable of storing 30 million gallons of wastewater.
- In 2003, US FWS hired a full time project manager for the Grassy Island remediation site. In 2001, U.S. Congress authorized funding to address the contaminant problems on Grassy Island to eventually turn the island back into productive use for wildlife. The Service is currently moving forward on plans to more fully characterize the risks from the identified contaminants and evaluate the feasibility of several approaches to reduce contaminant risks and enhance long-term benefits of the area for fish and wildlife.
- In October 2003, Friends of the Detroit River began a $35,000 project to work toward locating and mapping outfalls along the Detroit River; determining the type, source, ownership and composition of each discharge; creating a single source database of outfall information that will be available to the public; and providing training and training materials for the development of a “citizens’ volunteer group” to assist in monitoring outfalls along the river.
- Four hundred and ten acres of Humbug Marsh, which represents the last mile of natural shoreline on the U.S. mainland of the Detroit River, were acquired in September 2003. The Humbug Complex, in Gibraltar and Trenton, Michigan, is made up of Humbug Island, Humbug Marsh and adjacent undeveloped upland habitats. Because they are home to such a high diversity of fish and wildlife, the marshes have been identified as globally unique and significant in biological diversity.
- The Grosse Ile Land and Nature Conservancy rehabilitated 280 feet of shoreline along Gibraltar Bay at the southern end of Grosse Ile in June 2003, through a $28,000 grant.

- In March 2003, USACE donated 168 acres of wetlands, south of Pt. Mouille State Game Area, along the Detroit River, to US Fish and Wildlife Service for inclusion into the Detroit River International Wildlife refuge.
- In March 2003, USGS completed an $80,000 project to identify candidate sites for habitat protection and remediation in Michigan waters of the Detroit River. This was one of the highest priority recommendations in the Detroit RAP Report. The inventory complements a previous survey of habitat in Ontario waters of the Detroit River. The objectives of the inventory were to: 1) locate candidate sites for protection and restoration of fish and wildlife habitat in Michigan waters of the Detroit River; 2) describe the ownership and size of each site, as well as its potential for habitat protection and restoration; and 3) subjectively assess the extent to which existing habitat along the river is productive of fish and wildlife and protected from land uses that have degraded or destroyed such habitat. The report can be found at http://www.glsc.usgs.gov/research/detroitriver.asp.
- In December 2002, U.S. President Bush signed a bill to officially create the Detroit River International Wildlife Refuge. The refuge includes islands, coastal wetlands, marshes, shoals, and riverfront land along 18 miles of the Lower Detroit River from Zug Island to Sterling State Park. The refuge also includes Mud Island, Grassy Island, and the 330-acre Wyandotte refuge.
- A plan to create a pedestrian walkway and series of parks along the Detroit riverfront was announced December 2002 by Detroit Mayor Kwame Kilpatrick and several business and civic leaders. The Detroit Riverfront Conservancy has secured grants in excess of $10 million to develop a 62-foot-wide, three-mile long riverfront park and walkway along the Detroit River in downtown Detroit. In all, the city expects as much as $500 million to be spent in developing the riverfront.
- In October 2002, the Friends of the Detroit River was awarded $88,000 to design, fabricate, and evaluate an innovative mobile dredging unit with the potential for reducing sediment re-suspension and offsite migration of contaminants during dredging. The objective of the project is to demonstrate a method to control sediment re-suspension during environmental dredging in an effort to protect and maintain the chemical, physical and biological integrity of the waters of the Great Lakes basin ecosystem.
- In August 2002, $1 million in federal funds was secured by Wayne County to buy the 44-acre Chrysler Paint Plant site. The site had been vacant since the 1980s. Restoration plans for the site include creating a headquarters for the Detroit International Wildlife Refuge.
- In 2002, U.S. EPA launched a multi-agency cooperative initiative to address facilities in the Detroit watershed and flyway that have the potential to mismanage or discharge oil and other constituents to the river. Others involved are the MDEQ, Wayne Co. Dept. of Environment and City of Detroit Dept. of Environment.

Canada (www.on.ec.gc.ca/water/raps/detroit/intro_e.html)

Thirty-one priority recommendations were identified in 1996 for the Canadian portions of the AOC. Programs and projects have been undertaken or completed in at least 21 of the 31 priorities, and DRCC stakeholders and partners have undertaken over 70 restoration projects.

Achievements to date for the Canadian AOC include:

- The Windsor Riverfront Pollution Control Planning Study was completed and adopted by the city. It developed a strategy that would satisfy regulatory guidelines for combined sewer overflow control, and would reduce pollutant loadings to the river to levels consistent with RAP objectives.
- Cost savings were identified toward the upgrade of Windsor's primary sewage treatment plant to secondary standards as a result of innovative treatment technologies.
- The effort to upgrade Windsor's Lou Romano Water Reclamation Plant is planned for completion date in 2006.
- Upgrading the Amherstburg Sewage Treatment Plant is in the planning stage.

- Since 1990 over 366 hectares of wetland in the Canadian AOC have been restored or protected.
- The Essex Region Conservation Strategy and Essex County Stewardship Network have implemented rural Non-point Source Remediation Program and Biodiversity Conservation Strategy projects.
- A number of habitat enhancement projects completed in 2003 helped to address the chronic problems of loss of fish and wildlife habitat in the Detroit River AOC. These projects were planned and sponsored by the DRCC and DRCC members.
- Public education has also been a priority through efforts to expand the DRCC web site, sponsor watershed hiking and biking tours, and participate in other outreach events.

In July 2003 DRCC implementation efforts were strengthened by addition of a community-based implementation specialist. Working closely with federal, provincial, and local agencies, the implementation specialist enhances stakeholders' ability to communicate and work cooperatively on issues such as project implementation, monitoring, progress reporting, and public involvement. This position was part of a restructuring effort intended to coordinate and improve DRCC and implementation activities

One of the projects planned for 2004 is a Household Mercury Collection Project, which is being implemented by the DRCC along with its partners - the City of Windsor, the Essex-Windsor Solid Waste Authority, Environment Canada, and the Ontario Ministry of the Environment. The project will take place during the month of April, throughout which the public will be urged to bring household items containing mercury to the Household Chemical Waste Depot in exchange for an incentive. This project has considerable support, and aims not only to remove mercury items from the waste stream, but also, through the associated educational efforts, to raise awareness of mercury problems in the AOC.

Wheatley Harbour RAP, Ontario (www.on.ec.gc.ca/water/raps/wheatley/intro_e.html)

Wheatley Harbour AOC is a small, confined shipping harbour on the north shore of Lake Erie. The AOC encompasses the harbour proper, and the wetlands in lower Muddy Creek. The Muddy Creek watershed, which feeds into the AOC, is some 10 km^2 of clay-veneer till plain. Topographic relief is gentle, and land use is predominately agricultural.

Overall, poor water quality has impacted the harbour's resources. The four BUIs currently identified as impaired are: degradation of fish and wildlife populations; restrictions on dredging activities; eutrophication or undesirable algae; and loss of fish and wildlife habitat.

Contaminant levels of some metals and PCBs exceed the provincial guidelines. The source of PCBs in the sediments has been tracked to a concentrating effect from historic fish processing operations. The metal concentrations are attributed to non-point sources including agriculture and leaking septic systems in the area. The total phosphorus concentrations in sediments and waters of most of the AOC exceed provincial guidelines. Present sources include fish processing at Omstead Foods Ltd., agricultural runoff and leaking septic tanks. Upgrades to the Omstead wastewater treatment facility over the last 20 years have reduced its contribution to phosphorus loads, and agricultural runoff to Muddy Creek is now the main source. The construction of a secondary sewage treatment plant to service part of the AOC has reduced inputs of nutrients and bacteria from the local community and from smaller fish processing plants such as McLean Brothers Fisheries. The completion of 41 septic system upgrades since 2000 is also reducing nutrient and bacteria inputs.

Habitat loss has resulted from the construction of the original harbour, and each subsequent expansion. Hardening of the shoreline and filling in of wetlands to create land for industrial, residential and farm land have altered many components of the natural ecosystem in the AOC and Muddy Creek watershed. The wetland is often nearly dry during summer from lack of stream flow as well as lake level variations. However, the wetland remains a feeding area to significant fish and wildlife species, and a popular bird watching venue. The public has identified wildlife as a feature worthy of protection. Since 2000, over 62 hectares (154 acres) of natural habitat have been restored in the AOC.

Additional measures are addressing public education about recreational uses and resource harvest. The Essex Region Conservation Authority and Essex County Stewardship Network are working with landowners to implement projects to reduce agricultural and septic contributions, and to increase habitat in the AOC.

An update of the combined Stage 1 and 2 RAP document is underway. A Wheatley Harbour Implementation Team (WHIT) has been established to direct further research, identify and undertake remediation measures, and evaluate progress.

Clinton River RAP, Michigan (www.crwc.org/)

The AOC includes the entire Clinton River watershed (1,968 km^2 or 760 mi^2), located just north of Detroit, and flowing 80 miles (128 km) from its headwaters to Lake St. Clair near the city of Mount Clemens. About half of the river's flow is treated wastewater from six municipal wastewater treatment plants. The RAP has identified eight of a possible 14 beneficial uses as impaired.

Through the Clinton River Watershed Council (CRWC), the Clinton River Public Advisory Council provides the state and federal government agencies with information on actions recommended in the RAP, reviews new technologies for monitoring and mitigation, and updates and promotes critical recommended actions.

Recent public participation activities in the watershed have included:

- River Day, Adopt-A-Stream, Student Monitoring Program, Storm Drain Stencilling.
- CRWC in partnership with Trout Unlimited seeks to explore the potential for the Clinton River and Galloway Creek to be an urban coldwater trout stream.
- The Annual Clinton River Cleanup has expanded to 12 sites across the watershed, and in 2002 included household hazardous waste drop-off points, a wetland Preserve Stewardship workshop, a wastewater treatment plant tour and beautification projects.
- School involvement in the watershed includes Student Monitoring Days in the fall and spring of each year, with a review of the data at an annual Student Congress.
- Storm water management projects are underway in the Stony Creek and Bear Creek tributaries to the Clinton River.
- In 2003, General Motors initiated its plans to dredge Harris Lake to remove oil residues present in the shallow sediments. The dredging activity is being conducted as part of a Corrective Action Agreement with the U.S. EPA and will take place under permits issued by the MDEQ.

St. Clair River RAP (U.S. and Canada) (www.epa.gov/glnpo/aoc/st-clair.html or www.on.ec.gc.ca/water/raps/stclair/intro_e.html)

This binational AOC extends 64 km from Lake Huron to Lake St. Clair. Contaminated sediments have been identified as a key source of contaminants to the aquatic environment. Problem definition in the 1991 Stage 1 report included six beneficial use impairments that are still remaining, although conditions have improved. These are degradation of benthos, restrictions on fish consumption, degradation of aesthetics, loss of fish and wildlife habitat, restrictions on dredging activities, and beach closings. Stage 1 also identified three beneficial use impairments that are no longer considered impaired: bird or animal deformities or reproductive problems, restrictions on drinking water consumption or taste and odour problems, and added cost to agriculture and industry. Forty-five remedial actions were recommended to restore the environmental conditions and beneficial uses in the Stage 2 report in 1995. Many of these actions have been implemented.

Three distinct zones of contaminated sediments have been identified, and Dow Chemical Inc. has made a public commitment to remediate Zone 1 sediments adjacent to its property over 2002-2004. Some 7000 cubic metres of contaminated sediment were removed, completing the first two phases of cleanup. In fall of 2004 the third phase, dredging, should be complete. MOE and Environment Canada are developing an ecologically based risk assessment approach to address the remaining contaminated sediments, Zones 2 and 3, and will discuss options with industrial and other RAP participants.

RAP accomplishments include upland and riparian habitat restoration, upgrading the Sarnia sewage treatment plant, reducing phosphorus, nitrogen, sediment and bacteria loading

to local watercourses, removal of Zone 1 contaminated sediments, and implementing the binational habitat strategy. The Binational Public Advisory Committee and RAP Implementation Committee produced an "electronic RAP" on CD-ROM, the first of its kind in the Great Lakes basin, funded by Environment Canada and MOE. Funding from Environment Canada and Lambton Industrial Society converted the electronic RAP to HTML format and it is now available on the "Friends of the St. Clair River" website. Major industrial and municipal point sources of chemical and bacterial contaminants have been controlled and reduced in virtually all the major facilities in both Ontario and Michigan. Frequency and size of spills have been dramatically reduced. Over 60% of non-point source recommendations have been acted on, and Lambton County and Sombra Township Official Plans address urban runoff and erosion controls. All of the habitat recommendations have been addressed in some manner. A "St. Clair River RAP 2000 Progress Report. Volume 1, Synthesis Report, and Volume 2, Technical Addendum" provide updated data and report on progress toward delisting the AOC.

9.3 Watershed Projects

Photo: Upper Thames River Conservation Authority

Community-Based Watershed Strategy Development - Black River (Ohio) and Kettle Creek (Ontario) Watershed Projects (www.erieforum.org/watershedprojects.php)

Working in partnership with multiple stakeholders in the Black River watershed in Ohio and the Kettle Creek watershed in Ontario, the Lake Erie Public Forum is developing and implementing community-based watershed strategy processes. The strategy process will build a partnership of community stakeholders within each subwatershed to identify local environmental concerns, develop action plans to address these concerns, and ideally establish a permanent local project coordinator position to continue implementation of the strategies in each watershed. Through a series of public meetings, focus groups, and consultations, supported by local research, the objectives of the watershed strategy process are to:

- prioritize community environmental concerns;
- identify activities to address land use management, emerging issues, and chemical use reduction;
- identify resources to implement those activities.

Photo: Environment Canada

Commitments from local agencies and community members were obtained early in 2004. The Ohio project will take place in a subwatershed situated along the West Branch of the Black River that includes the cities of Oberlin, Rochester, and Wellington. Most of the subwatershed is situated in Lorain County, with a portion in Huron and Ashland Counties. The project will be conducted within the boundaries of the subwatershed and project activities, therefore, will potentially take place in Lorain, Huron, and Ashland Counties.

In Ontario, the Kettle Creek Conservation Authority identified the Dodd Creek subwatershed as an area in need of a community-based strategy process. The subwatershed includes the Townships of Southwold and Middlesex Centre and is located in Elgin County.

Southern Grand River Ontario Aquatic Ecosystem Rehabilitation Initiative

The Grand River, Ontario is located in the eastern basin of Lake Erie. The watershed is home to 800,000 citizens. At 6800 km^2 in area, the watershed is the largest draining into the eastern basin of Lake Erie and comprises 30% of the Canadian portion of the Lake Erie watershed. The river flows through a variety of physiographic features that control its channel morphology and affect the characteristics of the river waters. Water quality and aquatic habitats have been significantly modified by land use activities in the watershed. Large storage reservoirs in the upper reaches of the watershed regulate the flow regime of the river. Through the years, many ecological improvements have been realized in the upstream reaches of the Grand River. However, water quality, habitat, and fish and wildlife populations in the southern reaches of this watershed remain impaired.

The principle causes of the above impairments are high sediment and nutrient loadings, especially from non-point sources, high biological oxygen demand, and habitat fragmentation and degradation caused by land use activities and dams. Restoring and protecting water quality and habitat diversity in the Grand River is critically important to achieving the Lake Erie LaMP restoration goals for the eastern basin of Lake Erie.

In the spring of 2001 a partnership of federal and provincial agencies, Six Nations, the Grand River Conservation Authority and local stakeholders was formed with the common objective of restoring the aquatic ecosystem in the Southern Grand River. The partnership builds upon other planning initiatives in the watershed. The focus of the initiative to date has been to assess the status of water quality, benthos and the fish community, especially walleye, in the Southern Grand River and to build capacity in local stewardship and rural water quality programs to address land use issues. Strategies to mitigate impairments will be finalized over the next year. Rehabilitation, protection and stewardship projects are being developed and implemented as financial resources become available.

Lake St. Clair Program

The need for a Lake St. Clair focus to coordinate and communicate the various ongoing programs and to identify areas where work is needed was recognized by the four lead government agencies (Environment Canada, U.S. EPA, Ontario Ministry of the Environment and Michigan Department of Environmental Quality) and in 2000 they approved a resolution to include Lake St. Clair under the 4 Agency Letter of Commitment. Under this commitment, a framework for managing Lake St. Clair has been completed, a binational monitoring committee (MUGLCC) has been established, and two binational monitoring activity inventories (MUGLCC 2000 and 2002) have been published.

The management framework will provide a platform for better coordination of lake related issues and efforts so that decision makers may more efficiently and effectively focus their efforts and resources. The key elements that form the basis of the management framework are: a Binational Partnership Agreement; a Binational Management Committee; a Binational Working Group; separate local U.S. and Canadian Watershed Coordinating Committees; and a Biennial State of Lake St. Clair Conference.

U.S. (www.epa.gov/glnpo/aoc/st-clair.html)

A team of stakeholders led by the U.S. Army Corps of Engineers (USACE) completed a draft Comprehensive Management Plan for Lake St. Clair/St. Clair River in September 2003. The Comprehensive Management Plan contains goals, objectives, and recommendations for environmental management of the lake. Final transmittal of the plan to U.S. Congress is expected in 2004.

Concurrent with the development of the Comprehensive Management Plan was development the Management Framework to detail procedures for coordination of binational lakewide management efforts. The U.S. Lake St. Clair Coordinating Council, under the Lake St. Clair Management Framework, has been meeting and has developed a list of priority projects for which they are currently pursuing funding.

In addition, an effort to create a coastal inventory for Lake St. Clair was kicked off on January 14, 2003, with a Project Management Team comprised of

representatives from local, state and federal agencies. NOAA Coastal Services Center is leading the Project Management Team to develop an Integrated Coastal Management (ICM) tool. The tool is being designed to: identify and rank potential restoration and conservation areas; inventory habitat; plan for land use; and evaluate impacts and alternatives for land development or conservation. The tool will calculate statistics that are used to examine how habitats function within a landscape. Results can be displayed within the tool as reports and maps or separate from the tool as ARC GIS maps and databases.

This tool is designed to be consistent with other Lake St. Clair efforts such as the Clinton River RAP, and the U.S. Army Corps of Engineer's Lake St. Clair Management Plan. Preliminary goals for the tool's use are: to identify, increase and restore habitat; to reduce impairments to beneficial uses; and to serve as a regional planning resource.

In June 2003, U.S. EPA held the second Lake St. Clair Conference. The focus of the conference was a review of efforts to restore and protect the lake; a presentation on the USACE draft Comprehensive Management Plan and discussion of its recommendations, and a presentation on the draft Management Framework.

Canada

In 2002, Environment Canada established a technical workgroup comprised of agencies with a responsibility for the environmental health of the Lake St. Clair Canadian watershed. Representatives from the following agencies participated in this workgroup: Environment Canada (chair), Fisheries and Oceans Canada, Canadian Coast Guard, Ontario Ministry of the Environment, Ontario Ministry of Natural Resources, Ontario Ministry of Agriculture and Food, Essex Region Conservation Authority, Lower Thames Valley Conservation Authority, St. Clair Region Conservation Authority, Upper Thames River Conservation Authority and Walpole Island First Nation. Agriculture and Agri-food Canada and Health Canada provided additional information. This workgroup was tasked with providing the Canadian information to be included into the USACE Lake St. Clair/St. Clair River Comprehensive Management Plan and for preparing the Canadian Lake St. Clair Watershed Technical Report. Key management areas that were identified in the Canadian Lake St. Clair Watershed Technical Report were: land use, nutrients, chemical contamination and habitat loss, and biological contamination.

In 2004 the Canadian Watershed Coordinating Council for Lake St. Clair will be established and will be comprised of largely the same members as the workgroup. Over the next two years, the Canadian Watershed Coordinating Council will complete a consultation process and develop recommendations to address the key management areas identified in the backgrounder report.

Thames River Restoration Committee

Ontario's Thames River watershed was identified as a target watershed to implement recommendations from the Lake Erie LaMP. In April 2003, representatives from Environment Canada, Fisheries and Oceans Canada, Lower Thames Valley Conservation Authority, Ontario Ministry of Natural Resources (Lake Erie Unit), Ontario Ministry of the Environment, Ontario Ministry of Agriculture and Food, Upper Thames River Conservation Authority, and First Nations met to share information and to plan implementation projects. Representation on the Committee was limited to agencies with management responsibility in the Thames River watershed. The Committee is a partnership of agencies interested in ecosystem restoration within the Thames River watershed, with particular emphasis on the fish community and aquatic species at risk.

The goals of the Committee are:

- to improve local water quality and habitat, in order to secure a healthy Thames River fish community, to the benefit of downstream areas (i.e., Lakes St. Clair and Erie);
- to ensure an ecosystem approach is taken that recognizes the importance of land use practices to water quality and fish habitat;
- to develop a State of the River report for the Thames River, using the fish community as an indicator;
- to develop a comprehensive fisheries management plan for the Thames River.

The committee will achieve its goals by focusing effort in the following areas:

1. *Ensure consistency with Lake Erie Lakewide Management Plan (LaMP) and Canada-Ontario Agreement (COA) priorities:*

- review proposed projects to ensure deliverables are consistent with the LaMP and COA;
- ensure focus is on work that is expected to benefit Lake Erie and Lake St. Clair;
- ensure that work is integrated with the Lake St. Clair Management Plan.

2. *Maximize the impact of funding from various sources:*

- develop proposals and leverage funds for implementation efforts that will improve the ecosystem health of the Thames River watershed;
- identify and match available funding to priority issues;
- utilize COA as seed funding, as a catalyst to attract further funding;
- target efforts to minimize duplication and maximize efforts.

3. *Coordinate activities among agencies and other interested parties:*

- organize a state of the Thames River workshop to bring together all interested parties to review the current status of the river and to discuss future directions;
- conduct a GAP analysis to determine information and research needs;
- establish a network of community groups, environmental groups, agencies, First Nations and non-traditional partners to maximize the integration of efforts;
- identify key issues brought forward by partners and the stakeholders they represent and develop actions to address these issues;
- involve stakeholder groups in developing and implementing plans, and help them access funding to implement restoration programs;
- integrate other agency planning processes into this project.

4. *Information/knowledge sharing and reporting:*

- develop indicators to demonstrate progress/improvements within the river and to link to changes in Lake St. Clair and Lake Erie;
- share information among agencies, communities, and special interest groups;
- organize a workshop to review the state of the Thames River.

5. *Communications:*

- identify key stakeholders to target;
- develop a communications plan that recognizes all the stakeholders and their interests;
- develop a process for regularly reporting or communicating progress;
- consider a variety of communication techniques (e.g., State of the River report, annual newsletter, internet site, email distribution list, etc.).

The first project of the Committee was the presentation of the "State of the Thames Workshop" in September 2003. The purpose of the two-day workshop was to provide a forum to share information among agencies and stakeholder groups currently working within the watershed. Proceedings of the workshop are available at www.thamesriver.on.ca.